Maryland Energy Administration
Energy Efficiency and Conservation Block Grants
Resource Guide for Maryland Local Governments

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INTRODUCTION

This resource guide is designed to provide Maryland's municipalities and counties with an overview of how the federal Energy Efficiency and Conservation Block Grant (EECBG) program will be administered by the Maryland Energy Administration (MEA). The guide will summarize key elements of the funding guidance from the U.S. Department of Energy (DOE), the sponsor of the EECBG program. Most of the guide is devoted to energy efficiency and other clean energy programs and technologies, providing basic information on program design and implementation.

EECBG Grant Overview

MEA will receive approximately $9.6 million in EECBG funds for projects to be implemented in the 13 Maryland counties and 147 municipalities not receiving EECBG grants directly from DOE. MEA will be allocating the majority of these funds using a population based formula.

MEA will also be using a portion of the EECBG funds to provide energy engineering services to help the counties and municipalities receiving grants to identify potential energy efficiency and conservation projects and/or to conduct planning sessions for renewable energy projects. Assistance will be provided to help local governments assess their specific energy opportunities, prepare project bid specifications, and estimate project savings.

Purpose

The purpose of the EECBG Program is to assist local governments to:

- Reduce fossil fuel emissions in a manner that is environmentally sustainable and maximizes benefits for local and regional communities;
- Reduce the total energy use of the eligible entities; and
- Improve energy efficiency in the building sector, the transportation sector, and other appropriate sectors.

Local governments may develop initiatives and projects that address one or more of these purposes, and each activity is not required to meet all of the stated purposes. MEA encourages local governments to develop many different new and innovative approaches. However, all funds must be used cost-effectively and in a manner that yields longer-term energy and emission reductions benefits. All projects must also be conducted in a manner which complies with the DOE rules and regulations.

Eligible Activities

The Maryland Energy Administration (MEA) encourages local governments to use their EECBG funding allocations in projects that support the State of Maryland's energy goals. The State of Maryland has codified the following energy-related goals:

- *The EmPOWER Maryland Energy Efficiency Act of 2008* requires per capita electricity consumption to be reduced 15% by 2015
- Maryland's *Renewable Portfolio Standard* mandates renewable energy sources to generate 20% of retail electricity sales in 2022
- *The Greenhouse Gas Emissions Reduction Act of 2009* requires a 25% reduction in greenhouse gas emissions by 2020

The following programs support Maryland's energy goals:

Financing Programs: Financial incentive programs and financing mechanisms that enable energy efficiency improvements.

Public/Nonprofit Building Energy Efficiency Retrofits: Provide grants to nonprofit organizations and governmental agencies for the purpose of retrofitting existing facilities to improve energy efficiency.

Residential and Commercial Buildings Energy Efficiency Retrofits: Develop and implement energy efficiency and conservation programs for privately-owned buildings and facilities within the jurisdiction.

Development and Implementation of Transportation Programs: Develop and implement programs to conserve energy used for transportation purposes, including but not limited to promoting the use of satellite work centers; infrastructure such as bike lanes and pathways and pedestrian walkways; synchronization of traffic signals; and installation of solar panels on interstate rights-of-way to conserve energy in highway operations and maintenance activities.

Building Energy Codes and Inspections: Develop and implement building codes and inspection services to promote building energy efficiency.

Distributed Energy Technologies: Support distributed energy resource technologies that significantly increase energy efficiency, including: district heating and cooling systems; combined heat and power/cogeneration systems; energy storage systems; thermally-activated cooling systems; micro turbines; and ground source heat pumps.

Reduction and Capture of Methane and Greenhouse Gases: Purchase and implement technologies to reduce, capture, and use methane and other greenhouse gases generated

by landfills or similar waste-related sources, such as wastewater treatment plants, operations producing food waste, dairy farms and other animal operations.

Traffic Signals and Street Lighting: Replace traffic signals and street lighting with energy efficient lighting technologies, including light emitting diodes; and any other technology of equal or greater energy efficiency.

Renewable Energy Technologies on Government Buildings: Develop, implement, and install on or in any eligible government building onsite renewable energy technology that generates electricity from renewable resources, including solar energy; wind energy; fuel cells; and biomass.

The following programs are also eligible to receive funds through the EECBG program:

Development of an Energy Efficiency and Conservation Strategy: Develop and/or implement a strategy for energy efficiency and conservation and to carry out activities to achieve the purposes of the program.

Technical Consultant Services: Retain technical consultant services to assist in the development of such a strategy, including: formulation of goals; development of activities to achieve those goals; development of methods to measure progress toward goals; developing annual reports on strategies, goals, and achievements to the population served by the eligible entity.

Residential and Commercial Building Energy Audits: Support the conduct of residential and commercial building energy audits.

Material Conservation Programs: Undertake activities to increase participation and efficiency rates for material conservation programs, including source reduction and recycling programs that lead to increases in energy efficiency.

Grant Administration

In order to receive EECBG funds, each county or municipality will be required to enter into a grant agreement with MEA. As part of the grant agreement, a scope of work will be developed detailing the specifics of the proposed energy project(s) being funded through the EECBG grant program. In order to ensure that all grant funds are being used in a manner consistent with the DOE EECBG requirements, MEA must approve all energy projects funded through this program.

Counties and municipalities receiving grants from MEA will be required to encumber funds by **March 1, 2011**; however, counties and municipalities are encouraged to develop project plans during the first half of 2010**.** All grant funds must be spent by no later than **September 1, 2012,** as required by the federal U.S. Department of Energy.

Reporting and Invoicing Requirements

As part of the EECBG program, MEA is required to submit regular status reports to DOE. In order to be able to generate the report for DOE, MEA must receive regular updates from each grant recipient outlining project reporting metrics such as funds expended, energy saved or avoided, and jobs created. To help with the reporting process, MEA will develop a standard status report template. Each grant recipient will be required to submit grant status reports on a frequency outlined in the grant agreement.

Grant funds will be distributed through a reimbursement process. To be reimbursed, each local government will need to submit detailed invoices and the associated supporting documentation to MEA. Grant funds cannot be distributed in advance.

NATIONAL RESOURCES

Federal agencies, nonprofits, and other organizations can offer a wealth of information and resources that Maryland municipalities can leverage for their EECBG initiatives.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) has developed a set of resources for state and local governments to use in their energy-related Recovery Act efforts. These resources are available at:

http://www.epa.gov/cleanenergy/energy-resources/ee_toolkit.html.

EPA's website contains the *Rapid Deployment Energy Efficiency Toolkit*. This toolkit consists of a planning guide, a two-part implementation guide, and a helpline for questions.

EPA provides additional resources on the ENERGY STAR® website, which it cosponsors with DOE at www.energystar.gov.

EPA's State and Local branch also provides a substantial set of information and other resources for state and local governments at:

http://www.epa.gov/cleanenergy/energy-programs/state-and-local/index.html

These resources include a searchable database of publications and other information sources.

U.S. Department of Energy

In addition to cosponsoring the ENERGY STAR® program with EPA and administering the EECBG program, DOE also offers a wealth of technology and other information on energy efficiency and renewable energy at http://www.eere.energy.gov/.

Other Sources

Leading sources of information on energy efficiency and other clean energy topics include:

- The International Council of Local Environmental Initiatives (ICLEI)—ICLEI offers training, events, case studies, and publications among other services, viewable on its website at www.iclei.org

- The U.S. Conference of Mayors produced a 2007 Energy and Environment Best Practices report which describes numerous case studies for efficiency and clean energy efforts in municipal facilities, fleets, and other aspects of local government operations. It can be downloaded from http://usmayors.org/bestpractices/EandEBP07.pdf

- The National Association of Counties Green Government Initiative offers counties a range of resources and technical assistance, downloadable at http://www.naco.org/Content/NavigationMenu/County_Resource_Center/New_Technical_Assistance/Green_Government_Initiative1/Green_Government_Initiative.htm

MARYLAND RESOURCES

Maryland's local governments can jump-start and leverage their Recovery Act fund efforts by drawing on a number of existing programs offered by MEA and Maryland electric utilities. Readers should identify their electric utility and look up utility specific information via the web address listed below. MEA programs are generally available statewide.

Agency/Utility	Website
MEA	http://energy.maryland.gov/incentives/allprograms/
Allegheny Power*	http://www.alleghenypower.com/EngConserv/EngConservHome.asp
BGE*	http://www.bgesmartenergy.com/
Delmarva Power*	http://www.delmarva.com/energy/conservation/emppower/
Pepco*	http://www.pepco.com/energy/conservation/emppower/
Southern Maryland Electrical Cooperative (SMECO)*	http://www.smeco.com/energy/
Choptank Electric Cooperative	http://www.choptankelectric.com/safengwtr/touchstone_energy_savers.html

* As of August 17, Allegheny Power, BGE, Delmarva Power, Pepco, and SMECO have all had their EmPOWER Maryland programs approved. Information related to the EmPOWER Maryland programs will be added to the respective utility websites as programs become available.

PROGRAM SUMMARIES

This section provides one-page summaries of the programs that support Maryland's energy goals of achieving a 15% reduction in per capita electricity usage by 2015, generating 20% of retail electricity sales from renewable resources by 2022, and reducing greenhouse gas emissions 25% by 2020. The following energy programs will be reviewed:

- Financing Programs
- Public/Nonprofit Building Energy Efficiency Retrofits
- Residential and Commercial Buildings Energy Efficiency Retrofits
- Development and Implementation of Transportation Programs
- Building Energy Codes and Inspections
- Distributed Energy Technologies
- Reduction and Capture of Methane and Greenhouse Gases
- Traffic Signals and Street Lighting
- Renewable Energy Technologies on Government Buildings

PROGRAM	Financing Programs
Overview	A financing program can help agencies, homeowners, and businesses invest in energy efficiency. Three leading options include: • **Performance Contracting**—energy service companies develop projects so that building owners pay nothing up front and energy savings exceed debt payments. • **Property Assessed Clean Energy (PACE) financing**—local governments assess property taxes for costs of energy improvements, and loans are secured via tax liens. • **Revolving Loan Funds**—local governments lend money to building owners; repayments "revolve" so the money "recycles" through multiple projects over time
Target Market	• **Performance Contracting**—larger public agency and nonprofit institutional buildings • **Property Assessed Clean Energy (PACE) financing**—typically single family homeowners • **Revolving Loan Funds**—can be public agencies, nonprofit organizations, or private building owners
Typical Elements and Practices	• Typically requires enabling legislation at state level • Finance experts may be needed to structure financing effectively • Stakeholders should be engaged to make the program market-friendly • Program should be designed with long-term, sustainable administrative structures, with costs able to be covered by fees or market participants
Typical Impacts/Costs	• Depends on scale and design of the program • Performance contracting may require larger projects • PACE financing amounts may be limited by rule or market forces • Financing should be aimed at higher-cost, longer-payback projects • Projects should be cost-effective on a lifecycle basis.
Steps to Get Started	1. Review enabling legislation, regulations, ordinances 2. Define eligible buildings 3. Define financing mechanisms and administrative structure 4. Work with stakeholders to design market-friendly program 5. Design for scale to cover administrative costs 6. Develop outreach and marketing to ensure eligible building owners, and trade allies, are aware of and interested in the program
Further Resources and Assistance	**Performance Contracting**: MEA info at http://www.energy.state.md.us/incentives/state-local/epc/index.asp **Property Assessed Clean Energy financing**: http://www.pacenow.org; Maryland enabling legislation: http://mlis.state.md.us/2009rs/bills/hb/hb1567e.pdf Montgomery County Home Energy Loan Program at: http://pacenow.org/documents/HELP_Fact_Sheet.pdf **Revolving Loans:** Texas LoanSTAR program: http://www.seco.cpa.state.tx.us/ls/

PROGRAM	Public/Nonprofit Building Energy Efficiency Retrofits
Overview	EECBG grantees can use their grant funds to make energy efficiency improvements to existing public buildings, or nonprofit buildings such as schools and hospitals. Funds are typically granted directly to eligible building owners; matching funds may be required at the grantee's discretion. A grantee may also elect to operate a "direct installation" program, wherein the local government hires one or more contractors to install specified measures in eligible buildings.
Target Market	Buildings owned by local government agencies, public school districts, or nonprofit organizations dedicated to public purposes such as education, health care, or social services.
Typical Technologies and Practices	Building retrofits may include: • Lighting system improvements • Building retro-commissioning—tuning up energy systems to run as designed; (may be applicable only to larger buildings with complex HVAC and control systems) • Heating/cooling system improvements • Building envelope improvements, such as windows or insulation
Key Program Elements	• Program design: grants or direct installation of energy measures • Eligible buildings • Eligible efficiency measures • Role of installation contractors • Outreach and marketing • Measurement, verification, and reporting
Typical Program Impacts	Depends on the type, number, and performance of the measures installed, measured against the performance of the equipment that was replaced, or the operating condition of systems. Retro-commissioning can typically realize savings of 10-15% of heating and cooling costs.
Typical Program Costs	Depends on the type, number, and performance of the measures installed. Simple direct installation programs that primarily replace lighting typically spend $3-$4,000 per project.
Steps to Get Started	1. Define program type—direct grant, direct installation, or other 2. Define eligible buildings 3. Define eligible measures 4. Develop delivery system, via local contractors or other means 5. Develop program management, including marketing, measurement and verification, and reporting systems
Further Resources and Assistance	• U.S. EPA ENERGY STAR Buildings program for government: http://www.energystar.gov/index.cfm?c=government.bus_government • Building Commissioning Association: http://www.bcxa.org/

PROGRAM	Residential and Commercial Buildings Energy Efficiency Retrofits
Overview	Grantees can use funds to encourage home and business owners to invest in energy efficiency. Principal options include incentives such as rebates for specific measures, and direct installation of a set of low-cost measures.
Target Market	Residential and commercial buildings in the grantee's jurisdiction.
Typical Technologies and Practices	• Residential: comprehensive retrofits through the Home Performance with ENERGY STAR program, which can include sealing air leaks, insulation, and HVAC upgrades; direct installation of low-cost measures like CFLs, showerheads and faucet aerators, and water heater insulation; and rebates for specific measures • Commercial: direct installation of simple measures like lighting; rebates for specific measures like lighting, HVAC, food service/refrigeration
Key Program Elements	• Program design: comprehensive services, rebates, or direct installation • Eligible buildings • Eligible efficiency measures • Incentives—may include rebates; can also leverage federal tax incentives • Role of installation contractors • Outreach and marketing • Measurement, verification, and reporting
Typical Program Impacts	• Residential: comprehensive programs like Home Performance can reduce home energy usage by 60 million source Btu/home; direct installation of low cost measures typically saves about 5 million Btu/home • Commercial: direct installation typically saves about 400 million source Btu/project
Typical Program Costs	• Residential: comprehensive programs typically spend $5-10,000/home; direct install programs typically cost $1000/home or less • Commercial: direct installation typically costs $3-4,000/project
Steps to Get Started	1 Define program type—comprehensive, rebate, direct installation, or other 2 Define eligible buildings 3 Define eligible measures 4 Develop delivery system, via local contractors or other means 5 Develop program management, including marketing, measurement and verification, and reporting systems
Further Resources and Assistance	• EPA Rapid Deployment Energy Efficient Toolkit: http://www.epa.gov/cleanenergy/energy-resources/ee_toolkit.html • Home Performance with ENERGY STAR: check with local utilities, or visit http://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_hpwes • Tax incentives: Tax Incentives Assistance Project at http://www.energytaxincentives.org

PROGRAM	Development and Implementation of Transportation Programs
Overview	Grantees can create programs to save energy, including satellite work centers, bike lanes/pathways, pedestrian walkways, synchronization of traffic signals, idle-reduction technologies and/or facilities to reduce freight truck energy, and solar panels for highway signage and communications.
Target Market	Any land area, facility or right of way owned by or accessible to a grantee.
Typical Technologies and Practices	• Smart Growth plans covering land use and transportation • Traffic signal synchronization hardware and software • Truck-stop energy/communications supply modules • Solar photovoltaic systems
Key Program Elements	• Land use, transportation or other planning process to guide initiatives • Clear authority to proceed • Detailed program plan showing costs, benefits, timeline, organization, roles • Coordination with state transportation and smart growth initiatives • Stakeholder involvement to get buy-in and participation
Typical Program Impacts	Varies depending on technology, scale, and usage patterns.
Typical Program Costs	Varies depending on technology, scale, and usage patterns.
Steps to Get Started	1. Assess grantee jurisdiction for feasible options in the near term 2. Develop project specifics: technologies, practices, benefits, costs, management plan, tracking and reporting system 3. Initiate procurement activities 4. Manage, monitor, and report on progress
Further Resources and Assistance	• Maryland Smart, Green, and Growing website at: http://www.green.maryland.gov/ • MEA transportation incentives at: http://energy.maryland.gov/incentives/transportation/index.asp • MDOT Recovery Act website at: http://www.e-mdot.com/Planning/Economic_Recovery/Index • Smart Growth America: http://www.smartgrowthamerica.org/transportation.html

PROGRAM	Building Energy Codes and Inspections
Overview	Grantees can use funds to support implementation, training, technical assistance, and inspection activities related to advanced building codes. Maryland, like other ARRA recipient states, agreed to upgrade its energy codes statewide to the stringency levels of the latest International Energy Conservation Code for residential buildings and the latest ASHRAE 90.1 standard for commercial buildings. The state must also create a plan to achieve 90% compliance within 8 years. Local governments play a lead role in code implementation and compliance which is where EECBG funds can be applied.
Target Market	All new homes or nonresidential buildings constructed in the grantee's jurisdiction
Typical Technologies and Practices	• Training code officials, builders, and contractors • Developing compliance materials such as laminated information sheets • Providing software tools for quick compliance checks • Developing inspection protocols for building officials • Engaging third party experts for energy inspection purposes
Key Program Elements	• Lead roles in appropriate agencies • Leveraging federal, state, and nonprofit building code assistance • Training program—curriculum, instructors, facilities, schedules • Outreach and engagement with key stakeholders • Ongoing technical support and resources
Typical Program Impacts	• The IECC 2009 residential code is estimated to save 12-15% compared to earlier versions • Pending Congressional legislation could raise future code savings to 50% beyond current versions
Typical Program Costs	Varies depending on type and scope of activity. Leveraging publicly-available tools and resources can enable useful efforts at modest cost.
Steps to Get Started	1. Assign lead roles to appropriate agencies, such as building departments 2. Define scope of activities, budget, benefits, costs 3. Develop management plan, including tracking and reporting system
Further Resources and Assistance	• U.S. DOE Building Energy Codes Program at: http://www.energycodes.gov/implement/state_codes/state_status.php?state_AB=MD • The Building Codes Assistance Project at http://bcap-energy.org/ • Maryland Building Codes Administration: http://mdcodes.umbc.edu/

PROGRAM	Distributed Energy Technologies
Overview	Grantees can use funds to develop distributed energy technologies that increase energy efficiency, including: district heating and cooling systems; combined heat and power/cogeneration systems; energy storage systems; thermally-activated cooling systems; and ground source heat pumps.
Target Market	Any site or facility within the grantee's jurisdiction found to be feasible and appropriate for such installations.
Typical Technologies and Practices	• **Combined heat and power** (CHP) systems, which can use natural gas turbines, fuel cells, or other technologies to produce both heat and power • **Thermally activated cooling**, also known as "absorption" cooling, which can use waste heat from turbines or other heat source to provide cooling in a CHP system • **District heating/cooling systems**, which provide steam, hot water, or chilled water to a group or campus of facilities • **Ground-source heat pumps**, which use underground piping to take advantage of the earth's relative constant temperature for cooling in summer and warmth in winter.
Key Program Elements	• **Authority and management**—distributed energy may require additional permits, funding authority, or legal authority to provide energy services beyond the scope of traditional building energy systems • **Technical and economic feasibility**—these applications typically require a minimum size, and dense development to make systems practical and economic • **Expertise**—these are complex systems and require careful design, expert development, and continuous operational oversight
Typical Impacts	Varies depending on the design, size, and operating patterns of each project.
Typical Costs	Varies depending on the design, size, and operating patterns of each project.
Steps to Get Started	1. **Feasibility assessment**—determine whether sites exist that would support distributed energy technically and economically 2. **Project development**—for feasible sites, develop design, costs, operating plan, and procurement specifications 3. **Project construction**—actively manage construction for quality and timeliness 4. **Project commissioning**—ensure that the project operates as designed
Further Resources and Assistance	• International District Energy Association: http://www.districtenergy.org/ • The Ground Source Heat Pump Consortium: http://www.geoexchange.org/

PROGRAM	Reduction and Capture of Methane and Greenhouse Gases
Overview	Grantees can use EECBG funds to purchase and implement technologies to reduce, capture, and use methane and other greenhouse gases generated by landfills, wastewater treatment plants, operations producing food waste, dairy farms, feedlots, and other animal operations.
Target Market	Eligible municipal and county entities, including wastewater treatment facilities, landfill sites, partnerships with private animal operations, electrical companies, fuel companies, industrial companies/sites.
Typical Technologies	• **Landfill:** bio-gas recovery equipment (including blowers and landfill gas burning boilers), gas to electricity conversion equipment (including internal combustion engines and generators). • **Anaerobic Digestion**: pre-mixing tank, batch or continuous digester, gas to electricity conversion equipment; system for distributing or spreading the effluent. • **Wastewater treatment**: methane gas recovery equipment, gas to electricity conversion equipment (including internal combustion engines and generators).
Key Program Elements	• **Site assessment**: determine which sites are suitable for eligible technologies • **Project development**: develop technical specs, economic analysis, other details • **Procurement:** develop RFPs, review bids, select/negotiate with winning bidders • **Construction Management**: oversight of installation process • **Commissioning**: ensuring systems work as designed • **Operation and maintenance**: keeping up system performance and reliability
Typical Program Impacts	Substantial reductions in purchased electricity and/or fuel. Varies depending on type of technology and system size and application. Substantial reductions in release of potent greenhouse gas emissions.
Typical Program Costs	Significant capital costs, with low or no fuel costs for some technologies. Lifecycle cost varies depending on type of technology, size of installation and usage patterns. For more specific information see the EPA's Landfill Methane Outreach Program Funding Guide, available at: http://www.epa.gov/lmop/res/guide/index.htm
Steps to Get Started	(1) Evaluate potential sites for appropriate technologies (2) Seek technical experts for project development assistance (3) Determine final number, type and budgets for projects (4) Start procurement and installation process
Further Resources and Assistance	• EPA's Landfill Methane Outreach Program (LMOP), website available at: http://www.epa.gov/lmop/ • EPA LMOP's guide Adapting Boilers to Utilize Landfill Gas: Available at: http://www.epa.gov/lmop/res/pdf/boilers.pdf • U.S. Environmental Protection Agency's AgSTAR Program web site. Available at: www.epa.gov/agstar/operational.html • U.S. DOE's Biomass and Alternative Methane Fuels (BAMF) Fact Sheet. Available at: www1.eere.energy.gov/femp/pdfs/bamf_wastewater.pdf

PROGRAM	Traffic Signals and Street Lighting
Overview	Grantees can use EECBG funds to retrofit outdated lighting equipment or replace old lighting with new, more energy efficient lighting systems. Traffic signal replacements are required by federal law to use LED technologies but EECBG funds can accelerate the timing of replacements.
Target Market	Eligible municipal traffic lights, pedestrian crossing indicators, public roadway lights, parking lot lighting, and public parking garage lighting.
Typical Technologies and Practices	• **Traffic Signals:** long lasting, energy-efficient light emitting diode (LED). Note that federal standards exist for traffic signals. • **Street Lighting:** pulse-start metal halide or light emitting diodes (LED).
Key Program Elements	• **Site assessment:** determine which sites are suitable for upgrades and determine reasons for upgrades (energy efficiency, safety, etc.). • **Technology assessment:** determine the appropriate replacement technology. • **Project development:** develop project technical specs, economic analysis including life cycle costs, and determine appropriate light levels and distribution (street lighting and parking area). • **Procurement development:** develop RFPs, review bids, select and negotiate with winning bidders. • **Construction management:** oversight of installation process. • **Commissioning:** ensuring system works as designed • **Operation and maintenance:** keeping up system performance and reliability.
Typical Program Impacts	Overall impact depends on age of existing equipment and technology replacements. **Traffic Signals:** many LED replacement lamps use only one tenth of the energy of their incandescent counterparts. **Street Lighting:** 50% energy savings in certain applications is a realistic goal while still maintaining proper light levels.
Typical Program Costs	Retrofitting existing equipment may have a lower initial cost than all new equipment, especially if existing electricity supply wiring, poles, and other support structures are used. Life cycle cost depends on technology and use.
Steps to Get Started	1. Evaluate site for appropriate technologies 2. Seek technical assistance for project development 3. Determine existing codes and standards. 4. Determine final lighting design, type, budget, and savings 5. Start procurement and installation process
Further Resources and Assistance	• How-to Guide for Effective Energy Efficient Street Lighting: http://www.rpi.edu/dept/lrc/nystreet/ • Energy Efficiency Traffic Signal Specifications: http://www.cee1.org/gov/led/led-main.php3 • DOE Municipal Solid-State Street Lighting Consortium: http://www1.eere.energy.gov/buildings/ssl/gatewaydemos_consortium.html

PROGRAM	Renewable Energy Technologies on Government Buildings
Overview	Grantees can use EECBG funds to install renewable energy and other distributed generation technology on or in any eligible government building. Eligible energy technologies include solar, wind, biomass or fuel cell systems.
Target Market	Eligible municipal and county government buildings, such as office buildings, schools, public safety facilities, storage facilities, etc.
Typical Technologies	• **Solar:** photovoltaic cells (PV), battery systems, power conditioning equipment (including inverters), safety equipment (including safety disconnects, grounding equipment, and surge protection), and power meters. Solar thermal systems, typically used for hot water, are also included. • **Wind:** wind turbines of various sizes • **Biomass:** direct-firing boiler and furnace fuel systems, co-firing boiler and furnace fuel systems, biomass gasification systems and anaerobic digestion technologies. • **Fuel Cells:** fuel cell stacks, power conditioners, and heat recovery systems
Key Program Elements	• **Site assessment:** determine which sites are suitable for eligible technologies • **Project development:** develop project technical specs, economic analysis, and other details • **Procurement:** develop of RFPs, review of bids, selection and negotiation with winning bidders • **Construction Management**: oversight of installation process • **Commissioning**: ensuring systems work as designed • **Operation and maintenance:** keeping up system performance and reliability
Typical Impacts	Substantial reductions in purchased electricity and/or fuel. Varies depending on type of technology and system size and application. Sizing systems to take buildings fully "off the grid" can be infeasible or extremely expensive.
Typical Costs	Significant capital costs, with low or no fuel costs for some technologies. Lifecycle cost varies depending on type of technology, size of installation and usage patterns.
Steps to Get Started	(1) Evaluate potential sites for appropriate technologies (2) Seek technical experts for project development assistance (3) Determine final number, type and budgets for projects (4) Start procurement and installation process
Further Resources and Assistance	• U.S. Department of Energy's Energy Efficiency and Conservation Block Grant Program web site. Available at: www.eecbg.energy.gov/solutioncenter/eligibleactivities/ • U.S. Department of Energy's Electricity Delivery & Energy Reliability: Distributed Energy Program. U.S. DOE web site. Available at: www.eere.energy.gov/de/installing.html • American Wind Energy Association web site. Available at: www.awea.org/smallwind/smsyslst.html • National Renewable Energy Laboratory web site (contains separate pages dedicated to wind, solar, biomass, and fuel cells). Available at: www.nrel.gov/learning